

(FILE 'USPAT' ENTERED AT 15:21:25 ON 20 SEP 1999)
ACT PROTECTDATA/L

L1 QUE PLU=ON DATA (2A) PROTECT?
L2 QUE PLU=ON UTILIZ? OR USE? OR USING
L3 QUE PLU=ON ALLOW? OR PERMI?
L4 QUE PLU=ON JUDG? OR COMPAR?
L5 QUE PLU=ON COPYRIGHT? OR COPY OR COPYING OR DUPLICAT?
L6 (398) SEA FILE=USPAT PLU=ON L1 (P) L2 (P) L3
L7 QUE PLU=ON FORBID? OR PROHIBIT?
L8 (65) SEA FILE=USPAT PLU=ON L6 AND L7
L9 QUE PLU=ON APPEND? OR ATTACH? OR ADD?
L10 QUE PLU=ON APPEND? OR ATTACH? OR ADDING? OR ADDED OR AD
L11 (55) SEA FILE=USPAT PLU=ON L8 AND L10 scanned
L12 QUE PLU=ON STOR? OR SAV?
L13 (55) SEA FILE=USPAT PLU=ON L12 AND L11
L14 QUE PLU=ON INPUT (P) DATA
L15 QUE PLU=ON ENCRYPT?
L16 (1) SEA FILE=USPAT PLU=ON 5392351/PN considered
L17 (0) SEA FILE=USPAT PLU=ON L16 AND (L15 (P) L14)
L18 QUE PLU=ON DIFFER?
L19 (1) SEA FILE=USPAT PLU=ON L16 AND (L18 (P) DATA)
L20 (5) SEA FILE=USPAT PLU=ON 5832083/PN OR 5796824/PN OR 5761651
/PN
L21 (5) SEA FILE=USPAT PLU=ON L20 AND (L18 (P) DATA) 6/11/97
L22 (304) SEA FILE=USPAT PLU=ON L6 AND (L18 (P) DATA) AND FY<1997
L23 QUE PLU=ON AFTER?
L24 (71) SEA FILE=USPAT PLU=ON L22 AND (L18 (P) DATA (P) L23)
L25 (0) SEA FILE=USPAT PLU=ON L24 AND 705/CCLS
L26 (0) SEA FILE=USPAT PLU=ON L24 AND 705/CLAS
L27 (3) SEA FILE=USPAT PLU=ON L24 AND 395/CLAS
L28 (1) SEA FILE=USPAT PLU=ON 5864683/PN AND (L23 (P) L18 (P) DAT
A)
L29 (1) SEA FILE=USPAT PLU=ON 5862325/PN AND (L23 (P) L18 (P) DAT
A)
L30 (1) SEA FILE=USPAT PLU=ON 5276876/PN AND (L23 (P) L18 (P) DAT
A)
L31 (14) SEA FILE=USPAT PLU=ON L24 AND 380/CLAS scanned
L32 (1) SEA FILE=USPAT PLU=ON L31 AND (L23 (5A) DATA (5A) L18)
L33 QUE PLU=ON UPDAT? OR PASTE? OR ADD?
L34 QUE PLU=ON L33 (3A) DATA
→ L35 QUE PLU=ON UPDAT? OR PASTE? OR ADDED OR ADDING# OR ADDS
L36 (0) SEA FILE=USPAT PLU=ON L20 AND (L35 (3A) DATA)
L37 (6) SEA FILE=USPAT PLU=ON 5392351/PN OR 5761651/PN OR 5832083
/PN
L38 (1) SEA FILE=USPAT PLU=ON L37 AND (L12 (P) L14) considered
L39 QUE PLU=ON L10 OR L33
L40 QUE PLU=ON PREPAR? OR GENERAT? OR DISPLAY? OR APPEND?
L41 QUE PLU=ON L39 OR L40

L42 1 S 5761651/PN considered
L43 1 S 5832083/PN
L44 0 S L16 AND (STOR? DATA)
L45 1 S L16 AND (STOR? (P) DATA)
L46 QUE PREPAR? OR GENERAT? OR APPEND? OR WORK? OR DISPLAY?
L47 QUE INPUT? (P) DATA
L48 0 S L16 AND (L47 (P) L46)
L49 QUE INPUT?
L50 1 S L16 AND (L46 (P) L49)

L51
L52
L53
L54
L55
L56
L57

0 S L1 AND L4
QUE END? OR ADD? OR JOIN?
QUE A OR INFORMATION#
QUE APPEND? OR ADDING# OR ADDED OR JOINING OR JOINED
0 S L16 AND (L54 (P) L53)
0 S L16 AND L54
1 S L42 AND (L54 (P) L53)
SAVE -L57 PROTECTDATA/L

considered

=> act protectdata/1

L1 QUE PLU=ON DATA (2A) PROTECT?
L2 QUE PLU=ON UTILIZ? OR USE? OR USING
L3 QUE PLU=ON ALLOW? OR PERMI?
L4 QUE PLU=ON JUDG? OR COMPAR?
L5 QUE PLU=ON COPYRIGHT? OR COPY OR COPYING OR DUPLICAT?
L6 (398) SEA FILE=USPAT PLU=ON L1 (P) L2 (P) L3
L7 QUE PLU=ON FORBID? OR PROHIBIT?
L8 (65) SEA FILE=USPAT PLU=ON L6 AND L7
L9 QUE PLU=ON APPEND? OR ATTACH? OR ADD?
L10 QUE PLU=ON APPEND? OR ATTACH? OR ADDING? OR ADDED OR AD
DS

L11 (55) SEA FILE=USPAT PLU=ON L8 AND L10

L12 QUE PLU=ON STOR? OR SAV?

L13 (55) SEA FILE=USPAT PLU=ON L12 AND L11

L14 QUE PLU=ON INPUT (P) DATA

L15 QUE PLU=ON ENCRYPT?

L16 (1) SEA FILE=USPAT PLU=ON 5392351/PN

L17 (0) SEA FILE=USPAT PLU=ON L16 AND (L15 (P) L14)

L18 QUE PLU=ON DIFFER?

L19 (1) SEA FILE=USPAT PLU=ON L16 AND (L18 (P) DATA)

L20 (5) SEA FILE=USPAT PLU=ON 5832083/PN OR 5796824/PN OR 5761651

/PN

L21 (5) SEA FILE=USPAT PLU=ON L20 AND (L18 (P) DATA)

L22 (304) SEA FILE=USPAT PLU=ON L6 AND (L18 (P) DATA) AND FY<1997

L23 QUE PLU=ON AFTER?

L24 (71) SEA FILE=USPAT PLU=ON L22 AND (L18 (P) DATA (P) L23)

L25 (0) SEA FILE=USPAT PLU=ON L24 AND 705/CCLS

L26 (0) SEA FILE=USPAT PLU=ON L24 AND 705/CLAS

L27 (3) SEA FILE=USPAT PLU=ON L24 AND 395/CLAS

L28 (1) SEA FILE=USPAT PLU=ON 5864683/PN AND (L23 (P) L18 (P) DAT

A)

L29 (1) SEA FILE=USPAT PLU=ON 5862325/PN AND (L23 (P) L18 (P) DAT

A)

L30 (1) SEA FILE=USPAT PLU=ON 5276876/PN AND (L23 (P) L18 (P) DAT

A)

L31 (14) SEA FILE=USPAT PLU=ON L24 AND 380/CLAS

L32 (1) SEA FILE=USPAT PLU=ON L31 AND (L23 (5A) DATA (5A) L18)

L33 QUE PLU=ON UPDAT? OR PASTE? OR ADD?

L34 QUE PLU=ON L33 (3A) DATA

L35 QUE PLU=ON UPDAT? OR PASTE? OR ADDED OR ADDING# OR ADDS

OR ADD

L36 (0) SEA FILE=USPAT PLU=ON L20 AND (L35 (3A) DATA)

=> s 5392351/pn or 5761651/pn or 5832083/pn or 5408351/pn or 5555304/pn or
5796824/pn

1 5392351/PN

1 5761651/PN

1 5832083/PN

1 5408351/PN

1 5555304/PN

1 5796824/PN

6 5392351/PN OR 5761651/PN OR 5832083/PN OR 5408351/PN OR 555

L37

530

09/000 24

L32: 1 of 1

US PAT NO: 5,408,531 [IMAGE AVAILABLE]
DATE FILED: Sep. 9, 1992
US-CL-CURRENT: 380/3; 235/379, 380; 380/4, 9, 23, 24,
49, 50, 54; 714/752, 755, 756

6
SUMMARY:

BSUM(11)

In the aforesaid example, generally, a secret number input by a **user** when the optical card recording/reproducing apparatus is **used**, and a secret number previously recorded on the optical card are read and compared. When they coincide, it is **allowed** to record/reproduce a data. When they do not coincide, it is prohibited to record/reproduce a data. Thus, an apparatus which includes the process of comparing such secret numbers with each other has an effect for **protecting** a data. However, an apparatus which does not include the process of comparing cannot attempt to **protect** a data, so that the data can be recorded/reproduced without constraints. Even if a data was encrypted, the feature that the data. . .

DETDESC:

DETD(17)

FIG. 6 shows an example of the case in which a **data** of the information byte has high randomness as an example of the process by the first **data** converting circuit 4. If the rotation is performed within the information byte, there is a high probability in which each **data** of the information byte is **different** from the original **data**. Therefore, the aforesaid formula (2) can be made invalid in each code word. Also, because the condition making the formula. . . errors cannot be corrected in the decoding circuit 9 at reproducing in an optical card recording/reproducing apparatus excluding the second **data** converting circuit 8 or an apparatus decoding by a **different** rule, so that the **data** cannot be reproduced correctly.

DETDESC:

DETD(48)

In the aforesaid first embodiment, a rule for **data** conversion by rearrangement of a **data**, such as **data** rotation is provided in each optical card recording/reproducing apparatus 1. It can be also operated as follows. That is, a plurality of **different data** converting means are provided in the optical card recording/reproducing apparatus and a plurality of **data** converting modes within the optical card recording/reproducing apparatus are specified by providing the mode for designating a converting rule of the **data** converting means in a recording/reproducing command from the host computer, so that the **data** cannot be reproduced if a designated mode from the host computer is **different** even if the optical card recording/reproducing apparatus is identical at both cases of recording time and reproducing time, and that the **data** can be protected as in the first embodiment.

DETDESC:

DETD(54)

In the case in which the selection of the **data** converting means transmitted to the optical card recording/reproducing apparatus 21 at recording is **different** from the selection at reproducing the converting mode at the second **data** converting means 23 corresponding to the **data** converting mode at the first **data** converting means 22 is not selected correctly. Therefore, the **data** arrangement or a bit value is not correctly reverted. Then, errors cannot be corrected and the **data** cannot be read.

DETDESC:

DETD(55)

The optical card recording/reproducing apparatus 21 is formed as mentioned above can actualize **different** secret-coding without changing the structure of the apparatus 21 by an alteration of a software on the side of the . . . the software of the host computer within an application system is made to be the same, the compatibility of a **data** for **different** systems is lost and the **data** can be protected between applications.

DETDESC:

DETD(57)

In the aforesaid first and second embodiments, a rule of **data** conversion is set at every host computer and every optical card recording/reproducing apparatus; however, a rule of **different data** conversion can be set in each optical card. This will be explained concretely on the basis of FIG. 11 as follows. FIG. 11 shows the structure of a controller which controls the recording and reproducing operations of the **data** from the optical card.

DETDESC:

DETD(63)

If the secret number which is **different** from that of the recording time is stored, the conversion irrespective of the recording time is executed. Accordingly, the EDAC circuit 37 is impossible to correct errors. In this case, **data** transmission from the EDAC circuit 37 to the first buffer 36 is prohibited. If it is possible to correct errors in the **data** transmitted from the **data** converting circuit 38 to the EDAC circuit 37, the **data** is temporarily stored in the first buffer 36 and transmitted to the host computer 33 by the first DMA circuit 34. When the **data** is transmitted, the host computer 33 displays a **data** read by, for example, displaying means 47.

DETDESC:

DETD(68)

Thus, if the rotation of a bit unit is applied to the information byte, almost all bytes having **different data** indicating the byte before and **after** the rotation. Therefore, in the case (except that an inverse process is executed for the **data** conversion by this rotation), if the **data** is reproduced, errors are generated exceeding a correcting ability of an error correcting code. Accordingly, the error cannot be corrected, so that a **data** cannot be read.

DETDESC:

DETD(70)

In . . . interchanged. In this operation, errors are generated

exceeding the correcting ability of the error correcting code at the reproduction because **data** representing bytes are **different** between before and **after** the replacement in most of the bytes. Accordingly, the errors cannot be corrected, so that **data** cannot be read.

DETDESC:

DETD(71)

FIG. . . . every byte unit in each divided unit. FIG. 14a shows a case before the rotation. FIG. 14b shows a state **after** the rotation in the right direction of one byte in every divided range in which information bytes are divided into groups of three bytes. In this operation, when a **data** is reproduced, the errors are generated exceeding the correcting ability of the error correcting code because the **data** representing bytes are **different** before and **after** the rotation. Accordingly, errors cannot be corrected and the **data** cannot be read.

DETDESC:

DETD(76)

That is, the **data** of one byte (eight bits) output from the coding circuit 2 is supplied to the first **data** converting circuit 4. The first **data** converting circuit 4 has inverts 81 and 81 which invert the second bit and sixth bit from LSB for a **data** of one byte to be input. Also, the first **data** converting circuit 4 has the structure for feeding the **data** as it is to the recording means 5 without inverting the other bits. In this way, such simple structure is able to actualize **data** conversion. Also, because the **data** of all bytes are **different** from the original **data**, the code words executed by such conversion become impossible to correct errors, so that a **data** cannot be read as in the aforesaid examples.

=> d

1. 5,408,531, Apr. 18, 1995, Information recording/reproducing apparatus for converting and processing data exceeding error correction ability at recording; Yoshio Nakajima, 380/3; 235/379, 380; 380/4, 9,